

## REMARKS

The examiner has rejected claims 1-3, 7-9, 13-15, 19-21, 25-27, 31-33, 37-39 under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The examiner has rejected claims 1, 7, 13, 19, 25, 31, and 37 as reciting various compositions of claimed refrigerant blends as well as overall ranges for the molar fractions. However, since the claimed ranges do not correspond with the recited molar fractions the examiner states that it is unclear exactly what applicant intends to claim (regarding the overall range of molar fractions).

Applicants have deleted the specific blends from claim 1 and claimed them in newly presented claim 43 to clarify the intended claim scope of old claim 1.

The examiner has rejected claims 2, 8, 14, 20, 26, 32, and 38 as reciting “with low temperature (evaporator) temperature”. The examiner correctly states that this is a typographical error.

Claim 2 has been amended to correct the typographical error and to clarify the meaning of the claim.

The examiner has rejected claims 3, 9, 15, 21, 27, 33, and 39 as reciting a temperature “as low as 118”. The examiner correctly states that there is no indication whether this is degrees C, F, or K and has requested correction.

Claim 3 has been amended to correct the typographical error by adding the designation “K” to the temperature listed. Basis for this appears in the specification at page 13, lines 1-3.

The examiner has rejected claims 3-6, 9-12, 27-30, and 33-36 under 35 U.S.C. 103(a) as being unpatentable over Little (USP 5,644,502).

The examiner states that Little discloses a refrigerant blend not containing HCFC's comprising argon (33 mol %), R-23 (33 mol %), and R-14 for use in a throttle device refrigeration system. Although the refrigerant blend does not comprise helium,

neon, R-125, R-236fa, E-347, R-245fa, or R-4112, the examiner points out that applicant's claimed ranges for the components encompass a mol fraction of 0.0 (for each component).

The examiner acknowledges that Little lacks specific disclosure of the molar fraction of R-14 present in this four component mixture. The examiner argues however that Little does disclose an R-14 molar fraction of 18 mole % in an eight-component mixture also comprising argon and R-23 and that, accordingly, it would have been obvious to one skilled in the art, when having a knowledge of the aforementioned references at the time of the invention, and when considering the prior art as a whole, to modify the refrigerant blend of Little to comprise R-14 (18 mol %) for the purpose of improving the efficiency of a low-temperature refrigeration system.

Applicants have amended their claims to conform to their preferred embodiment. Applicant's specification, at page 32, lines 8-13 states that, "... the use of the refrigerant components R-236fa, R-245fa, R-4112 and 3-347 is varied and the low end of the composition range is 0%. **The preferred embodiment uses some small percentage of at least one of these refrigerants.**" [emphasis supplied]

Thus, in accordance with their specification applicants' claims now require that at least one of the components R-236fa, R-245fa, R-4112 and 3-347 not be 0% when the others are 0%.

Claims 22-24 and 40-42 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. With the amendment of the base claims, it is believed that these claims are now allowable.

### **SUMMARY & CONCLUSION**

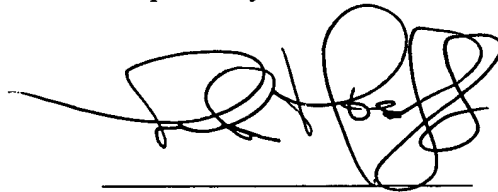
Applicants acknowledge the reference cited of record but believe that it cannot properly serve as a basis for rejecting the pending claims. In view of the above discussion of the issues, applicants respectfully submit that the claims are in condition

for allowance. Favorable reconsideration and allowance of the claims is respectfully requested.

If the claims are not yet found to be in condition for allowance, for any reason, the Examiner is respectfully requested to telephone the undersigned at (212) 940-8717, to discuss the subject application and/or to identify a time at which a personal interview would be granted.

Any fee due with this paper may be charged on Deposit Account 50-1290.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Serle Mosoff', written over a horizontal line.

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

1. [Once Amended] Refrigerant blends not containing HCFC for use in a very low temperature refrigeration system, said refrigerant blends in mol percent comprising:

[TABLE COLUMNS 2-5 DELETED]

Component	Overall range (mole %)
Argon	4 - 36
R - 14	10 - 55
R - 23	10 - 50
R - 125	5 - 20
R - 236fa	7 - 40

2. [Once Amended] Refrigerant blends not containing HCFC's, for use in a very low temperature refrigeration system where the evaporator [with low temperature (evaporator)] temperature is as low as 105K, said refrigerant blends comprising:

	<b>Ingredient Name</b>	<b>Range (% by mol)</b>
1	At least one of neon (Ne) or helium (He)	0.0 - 10.0
2	At least one of argon (Ar) or nitrogen (N2)	10.0 - 45.0
3	R - 14 (CF4)	20.0 - 50.0
4	R - 23 (CHF3)	10.0 - 30.0
5	R - 125 (C2HF5)	8.0 - 15.0
6	R - 134a	0.0 - 5.0
7	Other high boiling components: at least one of R - 236fa, E - 347, R - 245fa, R - 4112	0.0 - 3.0

3. [Once Amended] Refrigerant blends not containing HCFC's, for use in a very low temperature refrigeration system with low temperature (evaporator) as low as 118K, said refrigerant blends comprising:

	<b>Ingredient Name</b>	<b>Range (% by mole)</b>
1	At least one of argon (Ar) or nitrogen (N2)	10.0 - 40.0
2	R - 14	20.0 - 50.0
3	R - 23	10.0 - 40.0
4	R - 125	0.0 - 35.0
5	R - 134a	0.0 - 10.0
6	At least one of E - 347, R - 4112, R - 236fa, R - 245fa.	0.0 - 6.0

provided that at least one of E - 347, R - 4112, R - 236fa, or R - 245fa is present in the blend.

4. [Once Amended] Refrigerant blends not containing HCFC's, for use in a very low temperature refrigeration system with low temperature (evaporator) as low as 130K, said refrigerant blends comprising:

	<b>Ingredient Name</b>	<b>Range (% by mole)</b>
1	At least one of argon (Ar) or nitrogen (N2)	2.0 - 40.0%
2	R - 14	10.0- 50.0%
3	R - 23	10.0- 40.0%
4	R - 125	0.0- 40.0%
5	R - 134a	0.0- 15.0%
6	At least one of R - 245fa, R - 236fa, or E - 347, or R - 4112.	0.0- 30.0%

provided that at least one of R - 245fa, R - 236fa, E - 347, or R - 4112 is present in the blend.

5. [Once Amended] Refrigerant blends not containing HCFC's, for use in a very low temperature refrigeration system with low temperature (evaporator) as low as 140K, said refrigerant blends comprising:

	<b>Ingredient Name</b>	<b>Range (% by mol)</b>
1	At least one of argon (Ar) or nitrogen (N2)	2.0 - 40.0%
2	R - 14	10.0 - 50.0%
3	R - 23	10.0 - 40.0%
4	R - 125	0.0 - 30.0%
5	At least one of R - 236fa, R - 245fa, E - 347, or R - 4112.	0.0 - 15.0%

provided that at least one of R - 236fa, R - 245fa, E - 347, or R - 4112 is present in the blend.

6. [Once Amended] Refrigerant blends not containing HCFC's, for use low temperature refrigeration system with low temperature (evaporator) as low as 155K, said refrigerant blends comprising:

	<b>Ingredient Name</b>	<b>Range (% by mole)</b>
1	At least one of argon (Ar) or nitrogen (N2)	0.0 - 40.0%
2	R—14	5.0 - 50.0%
3	R—23	5.0 - 40.0%
4	R—125	0.0 - 40.0%
5	R—134a	0.0 - 30.0%
6	At least one of R - 236fa or R - 245fa	0.0 - 30.0%
7	At least one of E - 347 or R - 4112	0.0 - 20.0%

provided that at least one of R - 236fa, R - 245fa, E - 347, or R - 4112 is present in the blend.

43. [New] Refrigerant blends not containing HCFC for use in a very low temperature refrigeration system, said refrigerant blends selected from the group comprising Blend A, Blend B, Blend C, and Blend D where the components of each blend in mol percent are as follows:

	Molar Fraction (percent)			
Component	Blend A	Blend B	Blend C	Blend D
Argon	13	24	18	8
R - 14	34	26	35	24
R - 23	28	22	21	32
R - 125	11	11	12	11
R - 236fa	14	17	14	25